reports a case of psammoma of the cervical region, which produced a complete destruction of a cervical segment, and in which he observed spastic paralysis during the entire course of the affection.

In opposition to these facts I cite the facts of my case. The patient presented flaccidity during the entire course of her affection. Six months elapsed between the onset of the affection and death. This period is certainly more than is necessary for a descending lesion of the lateral columns to produce a spastic state of the paralysis, either by suppressing the inhibitory influence of the brain or by stimulating the cells of the anterior cornua. The destruction of the cord between the lower cervical and upper thoracic segments was, I may say, complete. The pathological process was slow and progressive.

That there is a centre in the lumbar cord, the above-mentioned experiments of Ferrier and others prove conclusively. But the question of an independent character of this centre presents certain objections. Assuming the existence of an autonomous centre in the lumbar cord, which in this case was totally severed from the encephalon, why did spasticity not develop? Is not this case an illustration of the dependency of the cord centre upon cerebral centres? I must conclude, therefore, that the reflex mechanism has multiple relations. The analysis of the accumulated observations tends more and more to show that the exclusivism of Charcot and Vulpian, on one hand, of Bastian, Crocq, Collier, and Buzzard, on the other, cannot be accepted, but that Grasset's views are more in conformity with facts—namely, that spinal, basilar, and cortical regions contain centres for reflexes and for tonicity.

SCLEROMA OF THE LARYNX.

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It is always of interest to record the phenomena of an unusual affection, and the study of scleroma of the larynx becomes the more interesting, for the reason that, like all diseases due to a bacillus, the contagious nature of the disease is to be considered, together with the possible need for recommending such action as will tend to prevent its spread.

We are all familiar with the interesting cases of scleroma of the nose, several of them having been recorded in our literature, but the case that I report herewith is the first instance of the affection beginning *de novo* in the larynx to be presented and published in North America. Like all cases seen in this country, this one had its origin in that part of Europe occupied by the Slavic race, in the northwest part of the old Kingdom of Poland, which belongs in part to Russia, to Austria, and to Prussia. The history follows:

On February 7, 1906, Annie W. presented herself at my clinic in the Throat and Ear Department of Mt. Sinai Hospital Dispensary, complaining of hoarseness and dyspnœa. The patient is a well-developed, healthy looking young woman, and gives her age as sixteen years, although from her height and weight she appears several years older. She was born in Russian-Poland in the Province of Wilna. She states that she never had any previous illness and was entirely well until three years ago, when while aboard ship, on her way to America, she caught cold and became hoarse; since that time the hoarseness has persisted, she has had masses of crusts and much secretion from her nose and nasopharynx, and within the past few months there has been increasing dyspnœa. The inspiratory effort has become more and more labored. There was at no time pain, fever, or loss of flesh. She has been able to continue her arduous duties as general house-servant. There is not now nor has there been any fœtid odor. Her parents are living, and she has brothers and sisters, all of whom are well. She can recall no one with whom she came in contact who had any similar condition or nasal disease.

Examination of the nose revealed quantities of secretion with crust formation, which, when removed, left a raw surface in places; but there was no hypertrophic spots anywhere. The nasopharynx and pharynx were absolutely normal in appearance. In the anterior commissure of the larynx there was the same crust formation, which was readily removed. There was a subglottic mass below the right cord, protruding into the larynx, diminishing its lumen by about one-half, and having a grayish appearance. The diagnosis of chronic catarrhal rhinitis and nasopharyngitis and laryngitis with a subglottic growth was made.

After thorough cleansing, portions of the mass were removed with the laryngeal forceps. They were small masses of pale tissue; translucent to a degree, resembling soft adenoid tissue. These were submitted, with the diagnosis of subglottic growth, to the Pathological Department of Mt. Sinai Hospital.

I am indebted to the chief of that department, Dr. F. S. Mandlebaum, for the report which follows:

"The specimen received for examination consists of several small pieces of a rather soft, grayish-white tissue covered with mucosa. After fixation in various solutions and hardening, they were embedded in celloidin and in paraffin. The sections were stained by the usual methods, as well as by various special stains. When viewed with the low power the sections convey the impression of a rather uniform cellular structure not unlike that presented by ordinary granulation tissue, and covered with apparently normal epithelium.

"With a higher power, several varieties of cells are seen. Granulation cells with small round nuclei are present in large numbers; also larger cells with an abundance of protoplasm. Besides these, plasma cells are found near the bloodvessels, and two varieties of larger cells to be described below. A delicate stroma of connective tissue is found throughout the sections. The bloodvessels are numerous and show, almost without exception, a marked proliferation of the adventitia. A few leukocytes are present in the neighborhood of the vessels, and the capillaries show a slight proliferation of endothelial cells.

"The distinguishing feature of the sections, however, is the presence of two varieties of cells mentioned above. The first is a huge cell with a homogeneous protoplasm which stains poorly or not at all. Its nucleus, when present, is always situated at the border of the cell. The general appearance is that of an enormous fat droplet. A very few of these cells show nothing further, but for the most part they contain bacilli. These are grouped almost without exception at the periphery of the cell body and the central part is quite free. A few of these cells are seen, however, entirely filled with bacilli. With the oil-immersion lens the bacilli are rather short and plump and their ends are rounded. Some appear almost like cocci. With some stains a faint indication of a capsule is seen. The bacilli are easily stained with the usual basic aniline dyes and also take the hematoxylin stain readily. These cells are those first described by Mikulicz as diagnostic of rhinoscleroma. They are found in great abundance in all the sections, but seem to have no relationship with any definite structure. A few bacilli are seen lying free between the cells, but almost without exception they are present only in the cells just described.

"The second type of cell is also of large size. This is the hyaline cell, which some authors consider to bear some relationship to the Mikulicz cell. Several varieties of these hyaline bodies are present, showing various stages of the formation of the hyaline substance. The form most commonly seen consists of many spherical granules quite round in shape and usually of uniform size. These fill the cell completely, and the nucleus is often seen in the exact centre of the cell, giving the appearance of a rosette. Other types show the nucleus pushed to the side, while here and there simple masses of hyaline material of a perfectly spherical form are seen lying free between the cells. With hematoxylin the hyaline bodies are tinged faintly blue, while eosin stains them intensely red. In none of the hyaline cells could any bacilli be seen. In sections stained with Unna's polychrome methylene blue, followed by aniline alum, the hyaline bodies are colored greenish blue. With Gram's method many peculiar variations are noted. Some show a flattening of the hyaline granules from pressure in the cell body, others show that certain granules stain more deeply than those immediately adjacent, while still others hardly stain at all. With Gram's method the hyaline bodies can be studied with greater ease than with any other stains employed. Although many observers disagree as to the reaction of the bacilli in cultures to Gram's stain, I find that in sections, if the decolorization is not carried too far, the bacilli hold the color when treated with this staining method. Regarding the number of hyaline cells present, as many as eighty to one hundred could be counted in one field with a medium-power objective."

In order to obtain, if possible, the bacilli in pure culture, further portions were asked for; these were removed with the customary bacteriological precautions, and from the freshly cut sterilized surfaces the bacteriological examinations were made. These examinations were conducted by Dr. H. L. Celler, who reports pure cultures of a mucoid, Gram-negative, capsulated bacillus, belonging to the Friedländer group. With the facts in hand, the presence of hyaline bodies, Mikulicz cells, and the bacilli obtained by culture, the diagnosis of scleroma (rhinoscleroma) is fully established.

I must admit that I was wholly surprised with the diagnosis presented by the pathologist, for there was nothing in the appearance of the growth that clinically resembled scleroma, and the impression is made that many other cases would be so diagnosticated if carefully sought.

The patient's condition, both as to hoarseness and dyspnœa, improved perceptibly from the first removal; bleeding was slight, and no reaction occurred. Her condition at a recent examination, three months after the removal of the growth, was of absolute freedom from dyspnœa and hoarseness; the copious catarrhal condition had greatly diminished, and there was a small grayish exudate still below the right cord.

A study of the literature of scleroma of the larynx must include those under the heading of rhinoscleroma. How vast the subject is may readily be gathered from the fact that Juffinger[1] has a list of 180 references to the general subject. Since the publication of Pieniazek's[2] article on rhinoscleroma a number of reports of cases of scleroma of the larynx have been recorded, and to enable a fuller study of the subject to the present time they are here briefly stated, reference being made only to those of undoubted authenticity and those in which the larynx was involved either alone or at first.

Our own literature on this subject is scant. Shurly[3] mentions Cornil and Alvarez to have recorded a case of scleroma confined to the larynx. Goodale[4] makes brief histological mention of rhinoscleroma. Ingals[5] says there is no proof of its contagiousness, while Kyle[6] mentions the variety beginning in the nose, extending to the pharynx and larynx, but does not speak of the affection originating in the larynx. In several instances members of the same family have had the same affection: Robertson[7] reports 2 sisters with scleroma, Secretan[8] 2 brothers, Baurowicz[9] 2 sisters and 2 brothers, Streit[10] 2 sisters, Gerber[11] 2 sisters (these latter may be the same ones mentioned by Streit). These would certainly indicate contagion.

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[1] Quoted by Mracek, Handbuch der Hautkrankheiten, Wien, 1904, iii, 567.

[2] Handbuch der Laryngologie, etc., 1898, pp. 1304–1328.

[3] Diseases of the Nose and Throat, p. 333.

[4] Diseases of the Eye, Ear, etc., Posey and Wright, p. 705.

[5] Diseases of the Eye, Ear, etc., Burnett, Ingals, Newcomb, p. 283.

While the diseased condition is usually found beneath both cords it is, as in my own case, occasionally one-sided. Thus, Juffinger,[12] in his excellent monograph on 38 cases of scleroma, says that he has been unable to find the record of any one-sided case of laryngeal scleroma; he has seen such a case, in which nothing was found in the nose and nasopharynx, but on removal of portions of the subglottic infiltration the diagnosis was established both by culture and the microscope. P. Pieniazek describes the condition and adds that Stoerk's blennorrhœa must be considered as scleroma, as also the cases described as chorditis vocalis inferior.

He formerly considered scleroma and hyperplasia of the mucous membrane as two different entities, but as the recurrences of the latter inevitably followed he reached the conclusion that they are all scleroma. He found the diseased state most often in the region of the glottis, particularly below the rima glottidis, in and over it, in the vestibule, and rarely in the trachea and bronchi. There may be diffuse infiltrations, large or small nodules, forming a granulomatous mass, protruding or lying flat on the surface of the mucous membrane. The largest tumefaction appears on the posterior tracheal wall and the small growths are soft and consist mainly of the Mikulicz cells. In time the number of round cells and connective tissue increases and the growths become firmer. Solitary nodes grow more slowly, contain more connective-tissue fibers, and the growths become very hard. They may, however, be quite soft and yielding.

As to the manner of onset: The prodromal catarrh begins in the nose and may persist for years before it reaches the larynx, and it may exist for years in the larynx before the formation of a scleromatous infiltrate appears. It is apt to be a long time before it spreads further, and hence it is rare for the bronchi or trachea to be affected early. It may last dozens of years, and often remains limited to a single spot, and it may be associated with pharyngeal and rhinoscleroma. There are cases in which, beyond the prodromal catarrh, there are no other symptoms.

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[6] Diseases of the Nose and Throat, p. 150.

[7] Internat. Centralbl. f. Laryngologie, Band viii, 70.

[8] Ann. des mal. d'oreille, du nez, etc., 1894, xx, 675.

[9] Arch. f. Laryngol. und Rhinol., 1900, x, 363

[10] Ibid., 1903, xiv, 257.

[11] Berl. klin. Woch., 1903, xl, 491.

[12] Das Sklerom der Schleimhaut der Nase, des Rachens, des Kehlkopfes und der Luft-röhr, Wien, 1892.

E. Bunzl-Federn[13] reports a case of scleroma of the upper air passages, in a male, aged nineteen years, born in Bohemia. His history is that three years before observation he began to be short of breath when walking rapidly; crust formations in the nose and throat followed. Six months before observation the dyspnœa became so great at night that he believed himself to be choking. He would then cough up hardened secretion and breathe freer. He was pale and anxious; there was stridor, dyspnœa, and loss of voice. Dark-green crusts filled the larynx and nose, which when removed relieved the dyspnœa. The cords were red and apparently broader than normal. This patient lived in Russia until he was fourteen years of age. The diagnosis was proved microscopically and bacteriologically; there is much to show that it began in the larynx.

Baumgarten[14] records a case in a female aged twenty years. For several weeks she has had two or three suffocative attacks daily, and became cyanotic. The aryepiglottic folds were infiltrated; there was slight mobility; the mucous membranes of the larynx were anemic and covered with small, white, dried blisters; the false cords and the interarytenoid folds were hypertrophied, and the true cords were hidden. The mucous membrane beneath the cords and that of the posterior wall were infiltrated and pushed forward, decidedly narrowing the lumen. Cultures from the nose and throat resulted in proof of the diagnosis. He has seen several cases primary in the larynx, but there were here and there nodules, while this patient had but the one in the nose, and this latter he believes to be of recent origin.

P. H. Gerber[15] says that no doubt the original nomenclature should be changed from rhinoscleroma to scleroma, especially if we accept subglottic cases of blennorrhœa (Stoerk) as of this variety. Without microscopic examination it would not have occurred to him to place the cases of chorditis vocalis inferior and similar ones among the scleroma cases. He records 10 cases of scleroma. In 9 subsequent cases there were no manifestations of changes in the external nose either at the time or for years after. The nose in 2 cases showed normal conditions, in 3 ozena, in 1 the usual hyperplastic rhinitis, and in 3 typical scleroma. In the posterior nares the septum was more or less thickened and the passages narrowed; in 1 case the pharyngeal tonsils were hypertrophied In none of the cases were there any typical changes in the pharynx; in 2 there were hypertrophied tonsils and granular pharyngitis. In the larynx in 3 cases the stenosis was superglottic; in the other 6 there was the usual subglottic swelling, partly with and partly without ozena of the trachea. Microscopic examination was not made in 3 cases; in 1 the result was negative; in 2 there was bacteriological examination only, while in 3 the diagnosis was confirmed histologically and bacteriologically; 4 cases came from Russian Poland and 5 from East Prussia; none of the latter had ever been in Russia.

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[13] Prag. med. Woch., March 30, 1899.

[14] Report of the Meeting of Hungarian Ear and Throat Physicians, October, 1898, Internat. Centralbl. f. Laryngologie, 1899, xv, 477.

[15] Arch. f. Laryngol. und Rhinol., 1900, x, 347.

Gerber says further that in the first series of 87 cases described by Wolkowitsch there were but 4 with normal external noses, while in Juffinger's 38 cases there were 34 with normal noses; the latter cases make the impression of milder infection. This cannot be attributed to early or late appearances, as he has had an opportunity of watching the patient from five to eight years; but it was due to a lesser virulence of the virus in all probability, and to the different geographical distribution. He is confident that the disease was conveyed from Russia; although its contagiousness is not proved, yet it has much in common with leprosy. He believes that the cases of Wolkowitsch, Juffinger, and his own show varying degrees of this infectious process; at each stage there is a diminution of the virus due perhaps to geographical conditions, commensurate with the increasing distance from the focus of the disease.

Bawrowicz, in a study of 100 cases of scleroma, says that the changes are more frequently found in the subchordal space than in the vicinity of the base of the epiglottis, and finally at the laryngeal entrance, but always on the inner surface of the larynx. The posterior wall of the larynx is rarely affected. Beginning anteriorly as a subchordal infiltration, it slowly descends to beneath the processus vocalis. This is rarely reversed. The tumefaction is at first pale red in color, then white, of smooth surface, connected either with the under surface of the cords or separated by grooves of greater or lesser depths. They are rarely one-sided, and the size of the lumen depends on their growth. The voice is usually affected. With the bacteriological or histobacteriological examination we are enabled to have a firm foundation for diagnosis and to differentiate it from lupus. In the early stages of the subchordal thickening there is a similarity to submucous inflammation, a perichondritis of the cricoid, a luetic or tuberculous infiltrate or new-growth; in primary conditions we should exclude these in the differential diagnosis. The length of time of change, slow development, absence of pain, and drying of secretion will aid in differentiating. In 6 of his cases the disorder occurred primarily in the larynx.

Additional cases have been reported by Majewski[16] (subsequent tuberculosis, death of the patient, and autopsy), Barth[17] (a subject who had never lived in a scleromatous country), Belogolow,[18] Ichemolossov[19] (involvement of the upper lids), Lenart,[20] Frankenburger[21] (involvement of the sternocleidomastoid muscle and superficial fascia, in addition to the soft palate and larynx), Ziffer,[22] Novotny,[23] Streit,[24] Hausel,[25] Deutschlander,[26] Lissauer,[27] von Zeissl,[28] von Sokolowski,[29] von Schiller,[30] Zienbicki[31] (fatal hemorrhage from erosion of the innominate artery on the fiftieth day after tracheotomy), and Petrini-Galatz[32] (the first native case in Roumania). Von Schrötter[33] also reports several additional cases that are of value in extending our knowledge of the course, pathogenesis, and extension of the disease. In 2 cases the tongue was retracted so much that a high degree of stenosis of the faucial isthmus was produced. In 1 of these cases, after lasting twenty years, the lesions seemed to remain quiescent. Another case suggests that the infection may remain latent for more than ten years, and another that the laryngeal diaphragms differ materially from the ordinary thin membranous diaphragm.

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[16] Monat. f. Ohrenh., 1900, xxiv, 250.

[17] Arch. f. Laryngol. und Rhinol., 1903, xiv, 573.

[18] Rev. hebdom. de laryngol., 1903.

Streit refers to the occurrence of the disease in Germany. He states that since 18 cases have been found in Germany (formerly it was confined to Galicia and Poland, but now may be found in Silesia and Prussia), the disease is more dangerous than leprosy, especially since leprosy is more readily diagnosticated. Having visited the scleromatous districts under governmental direction, he declares scleroma to be contagious, and he proposed: (1) Scleroma should be classed among the diseases requiring notification from the attending physician; (2) the foci should be under the particular control of the health officers of that district; (3) known cases should be seen at least once a year by the health officer, and be instructed in necessary hygiene; (4) every two or three years a special commission, one of whom at least should be a specialist, should visit the foci and make special examinations of the other members of the family; and (5) those requiring medical care should be sent at the cost of the State to Königsberg or Breslau, where a special place should be reserved for them. Private sanitaria are not available, as the segregation cannot be enforced in accordance with hygiene.

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[19] Rev. hebdom. de laryngol., 1903.

[20] Internat. Centralbl. f. Laryngol., 1903, 205.

[21] Wien. klin. Rundschau, 1902, xvii, 435, 451.

[22] Wien. med. Woch., 1902, lii, 1252, 1314.

[23] Prseglad Lekarski, 1903, No. 9.

[24] Loc. cit.

[25] Internat. Centralbl. f. Laryngol., 1904, xx, 153.

[26] Ibid., xx, 616.

[27] Allg. med. Central Zeitung, Berlin, lxxii, 111.

[28] Deutsches Klinik, 1905, x, 440.

[29] Internat. Centralbl. f. Laryngol., 1905, xxi, 128.

[30] Ibid., 185.

[31] Ibid., 265.

[32] Med. Orient, Paris, 1904, viii, 219.

[33] Verhandl. der Deutschen Pathol. Gesellschaft., 1905, p. 215.

Schilling[34] reports a case, probably rhinoscleroma, associated with diphtheria bacilli. Rhinoscopically there was a tumor the size of a cherry-pit, and whitish tumefactions of uneven surface, narrowing the lumen of the larynx, but there was no dyspnœa. Smears taken at different times showed diphtheria bacilli. The clinical picture had no analogy with that of chronic diphtheria. Portions of the growth from the larynx showed characteristic scleromatous conditions, whence Schilling believed there was an original scleroma with secondary diphtheria.

The diphtheria bacillus is often found in the mouth, and the diseased mucosa might well propagate the bacillus without the symptoms of diphtheria. The lesson to be derived is, not to depend entirely on the bacteriological examination; hence removal and examination of portions of the growth are essential. If the Mikulicz cells are found, we are compelled, in the light of our present knowledge, to accept the diagnosis of scleroma. Diphtheria serum had no effect in diminishing the bacilli in Schilling's case. The patient did not come from a scleromatous country; he is said to have worked with a Galician who had some nasal disease, and he may thus have become infected.

Buschke[35] does not depend too much on the presence of the bacillus for the diagnosis, since its etiological significance lately has been made dubious.

Of other spontaneous cases of scleroma occurring in remote countries there are two in Switzerland, and Wende records a case as occurring *de novo* in the United States. The latter does not seem to have been conclusively proved histobacteriologically.

As regards etiology, scleroma occurs oftenest in people who live in filthy surroundings, in huts with the bare earth for a floor, and in close proximity to animals like cows, pigs, dogs, and cats; and yet a fair proportion of those affected belong to the better classes. It is most likely that the former are most readily subject to a catarrhal affection, and that thus a place for the ready lodgement of the disease is found. Injuries to parts may add to the susceptibility. While it affects the nose more frequently than the nasopharynx and larynx, it may affect the mouth, the ear, the lids, and the cheeks. It is indubitably proved to originate in the larynx in some cases.

The prognosis as to recovery is bad. The general health may not be impaired save from such symptoms as the varying stenosis occasions. The disease may progress or remain quiescent for years; sooner or later there is recurrence.

TREATMENT. The external conditions have been much benefited by the use of the Röntgen rays. Removal of the laryngeal scleroma endolaryngeally has at times benefited the patient, as has the pressure of an O'Dwyer tube, both before and after tracheotomy. The increasing-sized Schrötter tubes have been useful for the time being.

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[34] Arch. f. Laryngol. und Rhin., 1905, xvii, 209.

[35] Berl. klin. Woch., 1905, xlii, 270.

From a study of this subject I am led to conclude that scleroma is a chronic incurable affection, contagious to a certain degree. It is safe to assume that there are many more cases than even the large number already recorded. As the highest art of medicine lies in prevention and not in treatment, it seems advisable that the sanitary authorities take appropriate action now, while the cases are comparatively few and far between. Whilst not agreeing with Streit as to the relatively greater dangers in scleroma than in leprosy, yet, because it is easier to control the few cases now than the many the future is sure to bring, his views as to sanitary regulations in Germany and the territory adjacent to the infectious district should receive cordial endorsement. As far as our own country is concerned every quarantine officer should look upon undoubted cases of rhinoscleroma as infectious, and the subjects thereof should not be allowed to land, but be deported at once. In addition, every case of long-standing hoarseness, with or without dyspnœa, especially when associated with chronic catarrhal conditions, should be detained until such time as some expert authority can determine the presence or absence of scleroma.

THE HEREDITY OF FORM AS ILLUSTRATED IN PATHOLOGY BY A STUDY OF THE CYSTS OF THE MIDDLE TURBINATED BONE.

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Some ten years ago I had occasion to comment[1] on the pathology and pathogeny of bony nasal cysts. Even at that time I found, on reference to the literature, that conclusions at which I had arrived from independent study had been anticipated in the works of other observers. The special literature of the subject previous to the above reference is given in an article by Stieda.[2] Notwithstanding the large amount of testimony to the correctness of the views of Stieda, Glasmacher, and others, the text-books on rhinology and many of the special articles which have appeared in the last ten years have contained a surprising number of fantastic and erroneous ideas of the growth of these bone cavities. These I shall not review.

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[1] New York Med. Jour., June 27, 1896.

[2] Arch. f. Laryngol., Band iii, S. 359.